

Claims

1. A transmitting apparatus using polar modulation, the apparatus comprising:

5 polar signal producing means for producing signals corresponding to an amplitude and a phase of a transmitting modulated signal from an input signal;

amplitude signal producing means for producing an amplitude signal from a signal corresponding to the amplitude;

10 phase- modulated signal producing means for producing a phase- modulated signal from a signal corresponding to the phase;

amplitude-modulation amplifying means for amplitude-modulating the phase- modulated signal by the amplitude signal and the phase- modulated signal to produce a transmitting modulated signal;

amplitude/phase detecting means for detecting an amplitude signal and a phase signal from an input signal to the amplitude-modulation amplifying means and an input signal to the phase-modulated signal producing means;

delay difference computing means for computing a delay difference between an amplitude signal and a phase signal based on the signal corresponding to the amplitude and the signal corresponding to the phase, which are produced by the polar signal producing means, and the amplitude signal and the phase signal, which are detected by the amplitude/ phase detecting means; and

30 timing adjusting means for adjusting timings of the amplitude signal and the phase signal based on the delay difference computed by the delay difference computing means.

2. The transmitting apparatus using polar modulation as
claimed in claim 1, wherein the delay difference computing
means computes a correlation function between the signal
corresponding to the amplitude produced by the polar signal
5 producing means and the amplitude signal detected by the
amplitude/phase detecting means and a correlation function
between the signal corresponding to the phase produced by the
polar signal producing means and the phase signal detected by
the amplitude/phase detecting means, and computes the quantity
10 of delay of the amplitude signal and the quantity of delay of
the phase signal from maximum values of the respective
correlation functions related to these amplitude and phase and
computes a delay difference from a difference between the
quantity of delay of the amplitude signal and the quantity of
15 delay of the phase signal.

3. The transmitting apparatus using polar modulation as
claimed in claim 1, wherein the amplitude/phase detecting
means is constructed of a digital circuit and has selecting
20 means for selecting either the amplitude signal or the phase
signal and analog - digital converting means for converting
the selected amplitude signal or phase signal provided at an
input section of the amplitude signal and the phase signal.

25 4. The transmitting apparatus using polar modulation as
claimed in claim 1, wherein the timing adjusting means has delay
means for delaying at least one of the amplitude signal and
the phase signal and delay controlling means for controlling
the quantity of delay of the delay means.

30 5. The transmitting apparatus using polar modulation as

claimed in claim 1,
wherein the timing adjusting means has rough adjustment means
for roughly adjusting the quantity of delay of the amplitude
signal and the quantity of delay of the phase signal and fine
5 adjustment means for finely adjusting the quantity of delay.

6. The transmitting apparatus using polar modulation as
claimed in claim 1,
wherein the timing adjusting means is constructed of a digital
10 circuit and varies a clock frequency of this digital circuit
to adjust the quantity of delay of the amplitude signal and
the quantity of delay of the phase signal.

7. The transmitting apparatus using polar modulation as
15 claimed in claim 4, wherein the timing adjusting means has a
plurality of inverters connected in cascade as the delay means
and a selector for switching outputs of the inverters.

8. The transmitting apparatus using polar modulation as
20 claimed in claim 4, wherein the timing adjusting means has a
digital filter capable of varying a delay time according to
a control signal as the delay means.

9. The transmitting apparatus using polar modulation as
25 claimed in claim 1, wherein the amplitude modulation
amplifying means is configured to have a power amplifier.

10. The transmitting apparatus using polar modulation as
claimed in claim 1, wherein the amplitude modulation
30 amplifying means is configured to have a variable gain
amplifier.

11. The transmitting apparatus using polar modulation as claimed in claim 1, wherein the amplitude modulation amplifying means is configured to have a mixer circuit.

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12. A method of synchronizing an amplitude signal and a phase signal in a transmitting apparatus using polar modulation, the method comprising the steps of:

producing signals corresponding to an amplitude and a phase of a transmitting modulated signal from an input signal;

producing an amplitude signal from a signal corresponding to the amplitude;

producing a phase- modulated signal from a signal corresponding to the phase;

15 multiplying the amplitude signal by the phase- modulated signal to amplitude modulate the phase- modulated signal to produce a transmitting modulated signal;

detecting an amplitude signal and a phase signal from an amplitude signal before the amplitude signal being multiplied by the phase- modulated signal and a signal corresponding to a phase before the phase- modulated signal being produced;

20 computing a delay difference between an amplitude signal and a phase signal based on the signal corresponding to the amplitude and the signal corresponding to the phase, which are produced from the input signal, and the amplitude signal and the phase signal, which are detected; and

25 adjusting timings of the amplitude signal and the phase signal based on the computed delay difference to synchronize the amplitude signal and the phase signal.

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